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CONSTRUCTION AND EQUIPMENT

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CONSTRUCTION

MINISTER OF INDUSTRIAL CONSTRUCTION DISCUSSES AUTOMATION

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 7, Jul 80 pp 36-45

[Article by A. Tokarev, USSR minister of industrial construction:
"Raising the Efficiency of Construction Through Mechanization and Automation"]

[Text] Under contemporary conditions it is extremely important to re-equip construction organizations by supplying them with highly productive heavy duty machines and vehicles, giving workers power tools, and significantly raising the level of mechanization of the primary jobs, in particular finishing work. The urgency of this challenge arises from the enormous scope of capital construction in our country, and the firm policy of industrializing construction, which is becoming a process of fully mechanized installation of buildings and structures from standard factory-made elements and components: various blocks and modular units. These blocks and modular units have a high level of readiness and are sometimes very impressive in size. For example, 20-ton blocks 24 x 12 meters in size were used in construction of the Baku Home Air Conditioner Plant. The blocks used at the Lutsk Melange Fabric Combine were 18 x 12 meters and weighed more than 40 tons; 500-ton blocks were used for the Ammonia-450 and Carbamide-450 installations at the Cherkassy Azot Production Association.

This makes it necessary to raise the level of automation and mechanization of construction. Nonetheless, the proportion of manual labor at the construction sites is still significant.

Each year the USSR Ministry of Industrial Construction turns over more than 2,400 industrial installations for operation, 350-400 of them included in the official list of the national economic plan. The annual volume of earthmoving is about 830 million cubic meters, loading volume is 175 million tons, concrete work 11 million cubic meters, plastering 75 million square meters, painting 180 million square meters, and installation -- about 45 million tons of metal design elements. Such a volume of work compels the ministry to raise the level of mechanization and automation, enlarge the stock of construction machinery, and improve its structure.

The USSR Ministry of Industrial Construction is working out comprehensive five-year and annual organizational-technical programs to accelerate the growth rate of labor productivity. Reducing the labor-intensiveness of jobs is central in them. These measures put the results of long-term target programs developed by the ministry in concrete form. Steps are being taken in four main directions: improving construction management and organization, improving organization of labor, raising the level of prefabrication in construction, and mechanizing labor.

The ministry has a large stock of construction machines, including 9,000 excavators, 10,000 bulldozers, 17,000 cranes of various types, and other equipment. We are building up our stock by receiving new machinery and power equipment from the machine building sectors of industry and through production at our subordinate enterprises. Each year the plants of the ministry manufacture efficient mechanized equipment worth a total of 200 million rubles. This includes 1,500 machines for earthmoving and ~~pile~~ ^{pile} work, 4,000 machines for finishing jobs, 500 concrete handling machines, 700 machines for roofing work, and 1,300 load hoisting machines and mechanisms. Among the types of equipment are tower cranes, concrete laying machines, truck-mounted concrete pumps, pile-driving units, plastering and painting stations, units for installing floors by vibration vacuum treatment, two- and three-high mills, special-purpose vehicles, standard sets of equipment for work subdivisions, and so on.

Following the decisions of the 25th CPSU Congress on insuring full loading of construction machines and raising their productivity by better organization of labor, the ministry worked out and is implementing measures to raise the efficiency of the equipment and improve the mechanization of construction work. Management of the stock of machines is being organized better. Specialized small power equipment sections have become the primary form of management. Thirty-two intertrust administrations, 22 trusts, and 72 administrations are working on questions of mechanization. These specialized organizations have concentrated about 95 percent of the stock of primary construction machinery. In addition, 162 sections and two administrations of small power equipment have been formed. This kind of specialization of work on technical servicing and repair of the machinery makes it highly productive (15-25 percent higher than the average for the ministry).

The coefficients of technical readiness and use of equipment over time are 2-5 percent higher in the mechanization trusts than in general construction organizations, while downtime within shifts is only two-fifths as much. The Omsk, Ufa, and Kazan' mechanization trusts use machinery most efficiently. Concentration of construction machines at special subdivisions promotes more efficient introduction of progressive forms of technical servicing and repair.

The formation of mechanization trusts makes it possible to maneuver with scarce equipment, which is not always fully loaded at general construction trusts.

The scarcity of some types of machinery and power tools is caused, in particular, by the fact that the Ministry of Construction, Road, and Municipal Machine Building is unable to supply enough of them to our workers. It would be wise, therefore, for USSR Gosplan to provide centralized allocation of material resources for the production and repair of mechanized equipment for the construction industries.

The Belorussian SSR Ministry of Industrial Construction has accumulated considerable experience with supplying small power equipment, tools, and devices to its workers. As result, the leading trusts of this ministry have attained high labor productivity. For example, labor productivity per worker per shift is 2.3-3.1 cubic meters of concrete work, 1.9-2 cubic meters of masonry, 25-26 square meters of plastering, and 42-54 square meters of painting.

The Orgstroy Mekhanizatsiya and Orgtekhstroy trusts of the Belorussian SSR Ministry of Industrial Construction, which work closely with it, play the leading role in production of small power equipment, especially types that are not produced by industry. The first-named of these trusts is the head organization. It searches for progressive types of small power equipment, manufactures and tests trial-models, and puts them in series production and use. The trust has a special division for promising development projects and exchange of progressive know-how. Seventeen divisions of the trust at different construction organizations in the republic work toward the introduction of innovations. The problem of full mechanization of construction work is being solved by establishing standard sets of machines, tools, and devices for each type of work. The trust has sent several hundred standard sets to construction sites for concrete, stone, roofing, painting, and plastering work. The sets for brigades go into workshop-storerooms. When the brigade moves to a different site the storehouse is transported by trailer. The full standard set is turned over to the small power equipment section or, where there is no such section, directly to the construction administration.

The Stroy mash [Construction Machinery] Specialized Production Association, which includes the Minsk and Dzerzhinsk experimental machine plants and the Orsha Plant for Production of Molds and Fittings, has a significant impact on raising the level of mechanization and automation of construction. In 1979 the economic impact of introducing equipment supplied to collectives of the Belorussian SSR Ministry of Industrial Construction by the association was almost 4 million rubles. Stroy mash has unified and standardized many parts and assembly components. The plants of the association formerly produced 34 type-sizes of reducing gears, but now produce only 10. Instead of 20 connecting pieces they now make nine, and of the more than 600 grades and profiles of rolled metal products formerly made only 250 remain.

The plants used to fill one-time orders; they have now switched to resolving the problems of full mechanization of construction work. The association has taken the path of establishing standard sets of mechanized equipment for definite production processes. In 1980 the association will provide Belorussian construction organizations with a large number of highly productive and long-lasting aggregates and units for applying spackling, truck-mounted concrete pumps, pneumatic devices for delivering concrete and mortar, and other equipment.

The equipment developed at the association has received high praise from construction workers and been sent outside the republic. It is now used widely at projects in Siberia and the Far East. The achievements of the association are exhibited each year at the Exhibition of the Achievements of the USSR National Economy. During the current five-year plant innovators of the association have received 41 medals from the Exhibition for development of 11 innovations. Stroy mash was a winner in the All-Union Socialist Competition for 1979. It was awarded the Challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Central Committee of the All-Union Komsomol and the name of the collective has been entered on the All-Union Board of Honor at the Exhibition of the Achievements of the USSR National Economy.

The collective intends to develop at least 40 new machines for enterprises of the construction industry before 1985. According to preliminary calculations achievement of this program will make it possible to release (hypothetically) about 5,000 construction workers and save more than 10 million rubles and 2,000 tons of metal.

Concentrating machinery at specialized mechanization trusts creates optimal conditions for using progressive technology in ongoing repair, which is done by the aggregate-assembly method, and in capital repair, using the flow-assembly method. The ASU-SORM computerized system is used for operational management of machine repair plants. This has markedly improved use of their capacities. The system of centralized technical servicing (TsTO) of machinery, done by a special brigade in hours when the machinery is not in use, is being used more broadly. The primary construction machines -- excavators, bulldozers, and cranes -- are included in TsTO first of all. The system now handles 16,000 machines. Introducing TsTO reduces the number of requested repairs by 10-12 percent and increases the work capacity of a machine by 150-360 hours per year. The TsTO system makes it possible to extend the life of the machinery, which is important in view of the scarcity of certain types of equipment.

Technical diagnosis is being introduced at organizations of the ministry to receive more accurate (instrument) evaluations of the technical condition of construction machines. The Stroy mekhanizatsiya-1 Trust of Glavmoskpromstroy [possibly Main Administration of Industrial Construction of the Moscow City Executive Committee] and the specialized

mechanization administration of the Odesspromstroy [Odessa Industrial Construction] Combine of the Ukrainian SSR Ministry of Industrial Construction have accumulated useful know-how in this area. Using documents developed by the motor vehicle transportation department at the Voroshilovgrad Machine Building Institute, they have set up technical diagnosis stations for the frames of truck cranes. The use of these stations makes it possible to cut the number of machines being sent in for repair by 30-40 percent, reduce the use of spare parts by 15-20 percent, and lower the expenditure of fuel and need for workers engaged in machine repair by five percent. UM-141 of Trust No 16 of the Belorussian SSR Ministry of Industrial Construction's Neftestroy [Petroleum Construction] organization is using diagnostic stations for automobiles and wheeled tractors. Each one produces an economic benefit of 70,000 rubles a year. Thus it would be wise to organize the production and delivery to construction workers of equipment for setting up large-scale technical diagnosis of machines without dismantling them.

Development of the progressive system of centralized technical servicing of machinery is being held up by the shortage of spare parts, assemblies, and operating materials. For example, the USSR Ministry of Industrial Construction has only 35 percent of the spare parts it needs for construction and road-building machines. Each year, therefore, the ministry is forced to appropriate up to 8 million rubles to produce spare parts. It would seem that the planning agencies should review the question of improving supply of resources and spare parts to repair enterprises. For its part, the Ministry of Construction, Road and Municipal Machine Building must standardize the types and varieties of machinery being produced and make them easier to repair.

The USSR Ministry of Industrial Construction has set up the all-Union construction-installation association Soyuzspetspromstroy [USSR Special Industrial Construction] for the purpose of raising the level of mechanization and automation in construction work. This association has seven construction-installation trusts, 40 specialized administrations, two motor pools, an office for the operation, testing, and repair of mine drilling equipment, and the technology-planning trust Orgtekhspestroy. The association does the following jobs: mechanized and hydraulic earthmoving; driving piles; cutting slit trenches and laying sewers; installing prefabricated reinforced concrete elements and the tanks of decontamination structures; building elevators and silos from cast in-situ and prefabricated concrete; fire and biological protection of construction components; installing roofs on facilities at large industrial complexes. Their performance of these jobs in construction of the plants of the Berezniki and Solikamsk potassium, Krasnodar and Gubakha chemical, Tobol'sk petrochemical and other enterprises demonstrated the high efficiency of the system.

Through creative cooperative work the USSR Ministry of Industrial Construction, USSR Gosstroy, Glavmosoblstroy [Main Administration of Construction in Moscow Oblast], and the Administration of State Motor

Vehicle Inspection of the USSR Ministry of the Interior have now developed and are introducing in construction a system of specialized vehicle transportation for hauling reinforced concrete components. This system makes it possible to accelerate the incorporation of new equipment, avoid duplication in development of design components, raise the technical level and quality of machinery, and standardize the assemblies used for the specialized vehicles. For example, the number of vehicle models is being reduced from 650 to 83. The system is based on a type-size series of specialized transportation vehicles. The 19 models of special semitrailers developed and put in series production at enterprises of the USSR Ministry of Industrial Construction will handle shipping for all types of reinforced concrete components now in production and can replace the 430 models now in use. About 1,600 standardized panel-hauling semitrailers are now being used by vehicle transportation enterprises of the ministry.

The comprehensive brigade of excavator operators and truck drivers working on the brigade contract method is a progressive form of labor organization that is spreading. The system of using standard sets of equipment for brigades is being introduced on the basis of the long-term target program Progress. Attention is focused on raising the level of mechanization of concrete, finishing, and roofing work, where the proportion of manual labor is greatest.

Progressive standard sets of equipment, tools, and inventory have been developed and are widely used. The number of standard sets in use is more than 4,000. They are being introduced most intensively at organizations of Glavvostoksibstroy [Main Administration for Construction in Siberia and the Far East]. As a result of this the productivity of labor of plastering, painting, roofing, and masonry workers has risen 25-30 percent compared to the average for the administration. The Volgograd Orgtekhstroy Trust has developed an efficient standard set for plastering workers. Using it raises the labor productivity of finishing workers by 50-60 percent. In the USSR Ministry of Industrial Construction 22 percent of all brigades for 10 types of construction and installation work now use brigade standard sets.

Mechanization and automation of labor encompass all sectors of construction, but special attention is being given to the most common and labor-intensive jobs. Each year organizations of the ministry put in more than 11 million cubic meters of concrete; more than 90 percent of this volume is handled by cranes equipped with buckets. Conveyor-type concrete laying units such as the UB-132 that deliver the concrete mix to the laying point from distances of up to 12 meters and include inert aggregates without size limitations cut labor expenditures almost 30 percent compared to cranes, but they cannot always be used in industrial construction. Therefore, pipeline-type transportation has begun to be used as well. Compared to the use of cranes it greatly improves production sophistication and the quality of the

objects under construction, cuts concrete losses, and reduces labor inputs by one-half to two-thirds.

Vibration vacuum treatment is used for install cast in situ floors. For laying finished floors this method makes it possible to cut the hardening time of the concrete by 15-20 percent, increase its surface strength, and significantly improve the appearance of the floors. The Ukrorgtekhstroy Institute of the Ukrainian SSR Ministry of Industrial Construction worked out a set of interdependent machines and assemblies for vibration vacuum treatment. This makes it possible to fully mechanize the process of installing floors. The surface is evened out and finished at the same time as the concrete is compacting. Using the equipment set a team of five workers can lay and finish up to 250 square meters of floor per shift.

Using inventory metal and metal-reinforced wood timbering manufactured at enterprises of the ministry in concrete work significantly reduces labor inputs and sharply cuts the prime cost of this work and the need for lumber. For example, using sets of general-purpose modular block timbering produced by the Ufa Construction and Road Machinery Repair Plant makes it possible to reduce labor inputs for assembling and dismantling the timbering by one-third to one-half compared with wood panel timbering. The timbering can go through 200-300 cycles.

The use of movable large-panel timbering manufactured by the Don Construction Machinery Repair Plant for installing concrete transverse load-bearing walls of buildings with precast and cast in situ floors is promising. The economic benefit from introduction of one set of timbering is 90,000 rubles a year.

The use of sliding timbering for installing load-bearing walls and floors of high-rise buildings is expanding.

The ministry is working constantly to raise the level of full mechanization in construction of buildings from modular elements. The manufacturing process for modular blocks is being improved. Special vehicles are being built to deliver them to the construction site, and equipment and accessories for installing the blocks are being introduced. The Don Construction Machinery Repair Plant has begun production of the MSK-400 crane, which is designed to install residential, administrative, and industrial buildings up to 16 stories tall using modular elements. The crane has a full-turn telescopic tower and a beam-type (maneuverable) boom with a mobile carriage. This makes it convenient to operate. The crane is moved from one site to another assembled on roll-under trucks.

Installation is accomplished without cranes where buildings are constructed by hoisting stories and floors. The entire work process is fully mechanized. The Yerevan Construction Machinery and Metal Construction Component plants manufacture the equipment and accessories

for this. The set of equipment used in constructing buildings by the method of hoisting stories into place includes 36 electromechanical hoists with 45-ton capacities, an electrical box, three control consoles, and a special stationary tower crane with carriage and a 5-ton capacity.

The development of high-rise construction made it necessary to deliver people and loads to the stories of the project quickly using machines. Definite progress has been made in this area. For example, the Krasnodar Machine Repair Plant produces the PR-1-172 rack and pinion hoists that can lift up to 500 kilograms. They are used for people and loads. The hoists have centrifugal speed governors, eccentric stop pins, equipment for emergency movement of the cabin, a device for stopping exactly at floor level, terminal switches, and sound signaling. They are much more economical than the PGS-800-16 cable-type passenger-load hoists.

Each year plants of the ministry produce up to 150 mast-type construction hoists with capacities of 500 kilograms. They are made in four type-sizes for hoisting to heights of 29, 38, 50, and 62 meters. They can be used to deliver various materials and articles, including long items, through window and door openings. Enterprises of the ministry are producing small portable dismountable K-1 cranes which can lift loads of up to 300 kilograms to a height of 50 meters. The crane is controlled from a portable control console by buttons. The OK-120 portable crane is efficient. It weighs 90 kilograms and can lift loads of up to 120 kilograms to a height of 30 meters. For moving it easily breaks down into assemblies that can be carried by individual workers.

In the current five-year plan the ministry has markedly reduced the use of manual labor in earthwork by raising the level of mechanization. Pile foundations are installed by a fully mechanized procedure. Ministry plants manufacture various types of pile drivers. The pile drivers mounted on T-40, T-100, and T-130 tractors and KrAZ trucks have done very well. This equipment is mobile, highly productive, and suitable for driving both dispersed piles and groups and fields of piles that must be installed and removed quickly. It can drive piles of up to 16 meters in length. For example, the KN-4 ram mounted on a T-40M tractor can drive small-section vertical and slanted piles up to four meters long and 700 kilograms in weight. The driving unit is mounted on a frame that is secured to the tractor. It uses a DM-240 hammer.

The KO-8 mobile pile driver mounted on a KrAZ truck is being used in industrial construction. It is designed to drive vertical and slanted piles at dispersed projects, test piles in geological surveying, and the column piles of farm buildings. A C-995 diesel hammer is used as the driving element. All the mechanisms of the pile driver are automatically driven and the control console is in the cab of the truck.

The machine can drive piles 30 x 30 centimeters in cross-section and up to eight meters in length. The pile driving equipment can be assembled and dismantled in 10 minutes without disassembly or the use of hoisting machinery.

The method used at Trust No 16 of Neftestroy, digging a single pit for putting in a large number of foundations at the site, offers good prospects for more efficient use of construction machinery. This provides a broad work front, creates opportunities to maneuver with machinery, and sharply reduces the proportion of manual work. Labor productivity rises 25-30 percent and the output of earthmoving machines and transportation vehicles rises 15-20 percent.

The SO-1-82 hydraulic hammer developed by VNIISTROYDORMASH [All-Union Scientific Research Institute of Construction and Road Machinery] is being used efficiently to loosen frozen ground at construction sites in the Bashkirskaya ASSR. This hammer is not only capable of breaking through the frozen shell of the ground but can also pulverize hard rock. Vehicular road workers use it to crush old road paving.

The MUR No 1250 hydraulic hammer is used to break up frozen ground and compact it in inaccessible regions and to break up old reinforced concrete elements. It develops an impact energy of up to 18 kilojoules where the impact element weighs 1250 kilograms. The hammer is mounted on the boom of an EO-4121 excavator in place of the lever arm and operates off its hydraulic system. The economic benefit from introduction of the hydraulic hammer is about 31,000 rubles a year.

Scientists at the Siberian Department of the Academy of Sciences USSR with the help of production engineers of the Uralsibpromekskavatsiya [Ural-Siberian Industrial Excavation] Trust developed the new Gidroimpul's machine for digging utility trenches. The machine removes the earth by means of composite mechanized shields. Its hydropercussive working element can break up hard rock and enables the machine to cut rapidly in any ground. With the Gidroimpul's blasting is not necessary and digging can be done successfully in regions of dense construction and utility lines. The machine was sent to construction sites after industrial testing at the Porok granite quarry near Novosibirsk.

The most labor-intensive part of construction work is the finishing jobs, which employ 22.5 percent of all the workers of contracting organizations. About 50 percent of the plastering work is done manually, about 60 percent of painting, and about 85 percent of the facing work.

The ministry has adopted a firm policy of full mechanization of these types of work. Some progress has already been made in this area. Thus, the Krasnodar Machine Repair Plant has begun producing the USHOS-4/2.5 plastering unit for full mechanization of plastering work. It mixes the plaster to a working consistency, delivers it to the work site,

and applies it to the surface. The equipment of the unit is installed in the heated bed of a ZIL-130 truck. The economic benefit from introducing this unit is about 4,900 rubles a year.

For painting the ANSh-4 spackling and painting unit with a productivity of 340 square meters an hour (with a spackling layer of up to two millimeters) is used. The unit is simple in design. The application of spackle and paint compounds is combined in a single operation. Labor productivity is increased 5-6 times by use of the unit. When lime and water-emulsion compounds are being applied the 4M-168 painting unit has proven very good. Its productivity for water-chalk compounds with four rods is up to 2,000 square meters an hour. The NRB-2 plunger-less pump works well for applying water-base paints and anti-septic and fire retardant compounds.

Enterprises of the ministry are producing semiautomatic units that cut a long roll of wallpaper with a continuous pattern into pieces of an assigned length by cross-perforation with simultaneous edge trimming. The perforation machine is adjusted and automatically turned on by means of quick-detachable measuring tapes. The semiautomatic device has a programmed counter that insures an assigned number of perforations, from one to 70. The annual economic benefit from introduction of this machine is 2,400 rubles.

A great deal is being done to mechanize roofing work. Each year construction sites of the ministry install about 26 million square meters of roofing from rolled materials. About 12,000 workers are engaged in this work, and until recently half of them worked manually. Sets of equipment are now being produced: mobile installations to transport and deliver the mastic to the roof, machines to spread the mastic and rolled roofing material over the roof, machines to unroll the roofing material, and rollers to compact the roofing material. Work is underway to develop a machine for flattening out the roofing, removing water, and drying the roofing.

From the standpoint of mechanizing labor-intensive processes and replacing heavy manual labor the greatest impact is achieved by introducing fused-on ruberoid (mastrum). All organizations of the ministry have mastered the technology of applying it. The fire method of heating the mastic layer with burners operating on solid fuel or gas has become most widespread. The fusing is accomplished by an unroller-applicator. The economic benefit per square meter of triple-layer roofing is about 1.15 rubles.

Standard sets of equipment for brigades have been developed and are being used in this five-year plant to raise the level of mechanization of roofing. These sets provide for mechanized work whether hot and cold mastics or fused-on ruberoid are used. The reduction in labor expenditures figured per brigade is 1,850 worker-days for hot mastics, 3,860 for mastrum, and 4,820 worker-days for bitumen-kukersol' mastics.

To improve engineering preparations for construction, many organizations have set up a system where articles are put in final condition and organized in sets at UPTK's (administrations of supply in complete sets), put in containers, and delivered to the sites by special vehicles. In the first four years of the current five-year plan 60 percent of the articles supplied had been prepared at UPTK's and 40-60 percent were shipped in containers and stacks, which greatly reduced manual labor. About 220 trusts of the USSR Ministry of Industrial Construction switched to supply through the UPTK's. At the present time about 30 percent of all construction freight is shipped in containers. As a result the ministry saves about 2 million rubles a year and frees more than 1,000 workers from heavy manual jobs.

More and more processes at enterprises of the construction industry are being automated and mechanized. In the production of reinforced concrete components a policy has been adopted of replacing obsolete flow-aggregate and stand-type machinery with progressive conveyor technology using two-high and three-high mills. Ceiling slabs for industrial buildings, 3 x 6 meters in size and fully factory ready, are an example of their output. Large industrial room-dividing walls are produced instead of small ones in cassette-type units. Long pieces of box-type Dinakor flooring are being manufactured. New plants for large-panel construction are maximizing mechanization and automation of processes. Fully factory-ready window and door blocks are being produced at the woodworking enterprises in Ufa, Meleuz, Shchekino, Shelekhovo, and Makhachkala.

The ministry has set up a specialized industrial design bureau called Stroyindustriya to raise the level of mechanization and automation of enterprises of the construction industry and develop plants to produce materials, articles, and design components whose use can fully or partially reduce manual labor. The very first results of the work of this bureau are having a positive impact on improving production.

The Scientific Research Institute of Reinforced Concrete of USSR Gosstroy, in cooperation with the Stroyindustriya Industrial Design Bureau of the USSR Ministry of Industrial Construction, has developed the DM-1 automatic unit for preparing and tightening reinforcement. The innovation is interesting because the operations now done to accomplish this purpose involve considerable expenditures of manual labor and this reduces them to a single, fully mechanized process. At the same time the DM-1 selects rods from packets, cuts them at measured lengths, sets the heads, heats by electrical contact combined with the lengthwise fittings of the reinforcement being tightened, lays the rods in the mold, and moves the molds by steps. The line does one rod a minute. The Ivano-Frankovsk Reinforced Concrete Elements Plant, which has put this unit to use, has had excellent results. Labor productivity in preparing and tightening reinforcement has more than tripled and the need for workers has been reduced accordingly.

The DM-1 can handle a maximum of one-third more tightening work than the former units. Thus, the strength properties of the material are used more fully. Exact cutting of the rods saves 15-30 percent of the steel. Ultimately, each cubic meter of finished reinforced concrete is 0.5-1.5 rubles cheaper, depending on the grade of steel used in the reinforcement.

The USSR Ministry of Industrial Construction makes an enormous amount of various kinds of machinery and does a large volume of repair work with its own personnel; in other words, it is forced to perform functions that are not appropriate for it because the machinery delivered by the Ministry of Construction, Road, and Municipal Machine Building is inadequate. This takes large amounts of money and hundreds of thousands of tons of various material every year. But centralized allocation of capital is not envisioned. This requires operational assistance to the construction ministries and departments by USSR Gosplan and USSR Gossnab. In our opinion, it would also be wise to set up centralized "service points" in the country to repair construction machinery.

The program laid out by the ministry for the 11th Five-Year Plan to reduce the labor-intensiveness of construction envisions hypothetical release of more than 300,000 workers by raising the level of prefabrication and factory readiness of construction components and introducing new, progressive materials. The proportion of construction using fully prefabricated, large-sized elements, assemblies, panels, and blocks is to be raised to 80 percent. The goal has been set of releasing more than 40,000 workers through mechanization of labor. About 65 percent of the brigades are to be supplied with standard sets of equipment.

During the coming five-year plan the implementation of new long-term target comprehensive programs to raise the efficiency of construction through mechanization and automation will begin.

The Progress program envisions a significant rise in labor productivity through reducing the proportion of manual jobs. Broad use of "dry" techniques in finishing work will double the output of finishing workers and achieve a significant savings of fuel and energy. About 70 percent of the roofs will be made of fused-on ruberoid. Enterprises of the ministry will produce 150 roofing units for this purpose, making it possible to mechanize 40 percent of roofing work. Supplying construction collectives with large numbers of concrete pumping trucks and concrete mixer trucks will be very important for raising labor productivity in concrete work. Broad use of the S-3 superplasticizer additive to concrete in making precast elements and casting in situ will afford greater convenience in applying concrete mixtures, reduce labor-intensiveness in this work by three-fourths, and reduce the use of cement as well.

The Mekhanizatsiya program aims at a large-scale transition to the use of highly efficient automated and mechanized equipment in production. Carrying out the measures envisioned by this program will produce a labor savings equivalent to 580,000 worker-days.

The collectives of the ministry will do everything they can to raise the efficiency of construction and reduce manual labor through full mechanization and automation of construction jobs.

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CONSTRUCTION

INSTRUCTION FOR PLANNING COMMERCIAL CONSTRUCTION OUTPUT

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, 1980 pp 7-8

["New Official Materials": "Commercial Construction Output: Provisional Methodological Instructions for Planning of Commercial Construction Output. Approved by USSR Gosplan resolution No 86 of 24 April 1980"]

[Text] In accordance with resolution No 695 of 12 July 1979 passed by the CPSU Central Committee and by the USSR Council of Ministers, entitled "On the Improvement of Planning and on Increasing Effectiveness of the Economic Apparatus on a Rise in Effectiveness of Production and Quality of Work," beginning with the 11th Five-Year Plan and in all annual and five-year plans, both a general volume of commercial construction output distributed among clients and able to be fulfilled by internal resources, must be approved in the list of indicators for ministries and departments that do construction-assembly work, and also for construction-assembly organizations.

The client ministries and departments must approve the quotas on the volume of commercial construction output for subdepartmental associations, enterprises and organizations.

In this connection the USSR Gosplan, in conjunction with the USSR Gosstroy, the USSR Ministry of Finance, the USSR Construction Bank and the Central Construction Administration have prepared the present Methodological Instructions, which should be adhered to in the development of drafts of plans for commercial construction output.

1. Volume of Commercial Construction Output.

1. The volume of commercial construction output includes:

a) The estimated cost of construction-assembly projects for enterprises leased to clients, their sections, complex starts and units ready for output of goods or services. The estimated cost of construction-assembly projects for these enterprises, sections, complex starts and units is included in the volume of commercial construction output which is actually fulfilled when the document certifying their readiness to be put into operation has been signed by the State Inspection Commission.

For enterprises (structures) built on credit, which is granted by the USSR Construction Bank to contracting construction-assembly organizations in accordance with the full cost of the construction of the enterprise (structure), the credit will be a specific amount accepted by the general contractor and leased to the client "under key." For these enterprises and also for units intended for civic housing, the estimated cost of construction assembly projects is included in the actual fulfilled volume of commercial construction output if the document of the State Inspection Commission is approved in the established order.

b) The estimated cost of construction-assembly projects for separate buildings and structures leased to clients, which are ready for output of goods and services and which form a part of enterprises (sections, complexes), if the use of such buildings, structures and premises is provided for prior to the completion of construction and before the enterprises (sections, complexes) as a whole are put into operation.

The possibility of putting these units into operation must be determined by the draft and approved by the draft-estimate documentation for the complex start.

The estimated cost of construction-assembly projects for the above buildings, structures and premises is included in the actual fulfilled volume of commercial construction output if the document certifying readiness for operation is signed by the worker's commission.

c) The estimated cost of projects which are not part of the complex start at enterprises, sections and units leased to clients for operation, and covered under subsections a) and b) of the present section and which must be completed and leased to clients in full. The estimated cost of such projects is included in the actual fulfilled volume of commercial construction output if their inspection document is completed in the established order.

d) The estimated cost of projects fulfilled in accordance with resolution No 38 of 13 May 1974 by the USSR Gosstroy, entitled "On the Deadline for Fulfilling Certain Projects in Areas of Planned Development." The estimated cost of these projects is included in the actual fulfilled volume of commercial construction output if the inspection document is in order.

e) The estimated cost of construction-assembly projects for the erection of temporary title buildings and structures, whose construction is carried out according to the enumeration stipulated as part of a project of a construction organization or approved separately by the client, using the assets apportioned for this purpose, called "Temporary Buildings and Structures," which are part of the total estimate for construction.

The estimated cost of construction-assembly projects for these buildings and structures is included in the actual fulfilled volume of commercial construction output if the inspection document certifying their readiness for operation is signed by the workers' commission.

f) The estimated cost of completely finished separate units and complexes of special construction or assembly projects, carried out by direct contracts with construction enterprises (organizations). The estimated cost of such units is included in the actual fulfilled volume of commercial construction output on the basis of signed documents of the workers' commission regarding the unit as a whole and, for complexes of projects, on the basis of documents certifying the inspection of completed projects.

2. The cost of capital repair projects is included in the volume of commercial construction output for finished complexes of these projects at separate buildings and structures, for each of which there exists an estimate approved in the established method. The basis for including these projects in the volume of commercial construction output is the document certifying inspection by the client of completed complexes of capital repair projects of separate buildings and structures. The cost of other contract projects is included in the volume of commercial construction output in accordance with the accepted system of assessing completed projects.

3. Commercial construction output of construction-assembly organizations (regardless of their hierarchical status) that fulfill projects in accordance with subcontractual agreements, is the estimated cost of complexes of special construction and assembly projects leased to general contractors in the period covered by the plan and carried out by the given subcontract organization at construction enterprises, complex starts, sections and units. The estimated cost of complexes of these projects is included in the actual fulfilled volume of commercial construction output by subcontract organizations which carry out the assembly of basic technological and power engineering equipment, according to the method established in subheadings a), b) and c) of heading 1 of the present Instructions for the general contractor, and, for other subcontract organizations--on the basis of inspection documents of the workers' commission, regardless of the deadlines for putting these enterprises, complex starts, sections and units into operation by the general contractor.

Moreover, complexes of projects that are completed by certain subdivisions, in accordance with the subcontracts, for other subdivisions of the same construction-assembly organization, which is a fundamental link, not financed by the State, in the chain of commercial output (a construction-assembly production association or trust or other associations which function in the established method under the Statutes concerning Socialist Government Production Enterprise), are not included in the volume of commercial production output.

4. The particular features of determining what is included in commercial construction output for separate types of specialized construction and special-purpose units are established by the USSR Gosplan in accordance with the desires of the appropriate ministries and departments of the USSR and of the councils of ministers of the union republics, in conjunction with the USSR Gosstroy, the USSR Ministry of Finance, the USSR Construction Bank and the USSR Central Construction Administration.

5. For the period covered by the plan the following things must be approved for the USSR ministries, departments and union republics engaged in construction-assembly projects:

a) The volume of commercial construction output for enterprises and units leased to clients and defined as the sum of volumes of commercial construction output, carried out in accordance with general and direct contracts, minus the volumes for capital repair and other subcontract projects.

b) The general volume of commercial construction output, defined as the sum of volumes of commercial construction output carried out in accordance with general and direct contracts, and also subcontracts for other ministries, USSR agencies and union republics, including volumes for capital repair and other subcontract projects.

Moreover, the general volume of commercial construction output in the plan is assessed on the basis of volumes fulfilled as part of State capital investments using assets of social organizations, collective farms and housing cooperatives, and on the basis of volumes fulfilled as part of capital repairs and other subcontract projects, and also on the basis of the contract type (general, direct, subcontract).

c) The volume of commercial construction output completed with internal resources and defined by excluding from the general volume of commercial construction output the volume of commercial construction output that is carried out, from the start of construction, by the organizations of other ministries, USSR departments and union republics according to subcontracts, at enterprises, sections, complex starts and units leased by a general subcontractor in the period covered by the plan. Furthermore, the volume of commercial construction output carried out by certain construction organizations for other organizations that belong to the system of the same ministry, USSR department and union republic according to subcontractual agreements (internal subcontract) is taken into account.

Moreover the volume of commercial construction output, defined in accordance with the present subsection, includes, in addition, the commercial construction output of subcontract organizations of the ministry, USSR department and union republic for construction production capacities and

units subject to be let to the general subcontractor of the same ministry, USSR department and union republic in periods subsequent to those of the plan.

The commercial construction output of these organizations, completed prior to the period covered by the plan for production capacities and units of constructions leased out in the period covered by the plan are excluded.

6. The volume of commercial construction output for enterprises and units leased to clients and also the general volumes and the volumes fulfilled with internal resources of commercial construction output for organizations of the middle echelons of administration (union republic ministries and departments of union republics, the main territorial administration, and also the all-union construction-assembly associations and other equivalent organizations) are determined in a similar fashion. The appropriate superior organizations approve these indicators for the above organizations.

7. For organizations at the basic administrative level the volume of commercial construction output for enterprises and units leased to clients is defined as the sum of volume of commercial construction output carried out in accordance with general and direct contracts without taking into account capital repairs and other subcontract projects; but the general volume of commercial construction output does take into account capital repair and other contract projects, as well as taking into account the volumes fulfilled according to subcontractual agreements for other organizations (regardless of their hierarchical rank).

The volume of commercial construction output fulfilled with internal resources is determined for the above organizations by excluding from the general volume of commercial construction output the volume of commercial construction output which is carried out, from the beginning of construction, by other organizations, in accordance with subcontracts, at enterprises, sections, complex starts and units leased by a general subcontractor in the period covered by the plan.

8. The volume of commercial construction output fulfilled with internal resources does not include projects fulfilled with internal resources that are leased to clients (general subcontractors) before 1 January 1981.

9. For enterprises and organizations which fulfill construction-assembly projects using internal resources, the commercial construction output is not covered by the plan.

II. The Method for Developing Plan Drafts of Commercial Construction Output

10. The preparation of annual and five-year plan drafts with regard to commercial construction output is initially worked out by production

associations, enterprises and client organizations and subcontract production construction-assembly associations, trusts, and other equivalent organizations.

The following are the basis for developing five-year plan drafts:

a) control numbers established for the clients according to the limits of construction-assembly projects, b) lists of constructions recently begun that stipulate deadlines for putting into operation the production capacities and units of construction and that stipulate the cost of their construction-assembly projects, c) title lists of carry-over constructions newly begun (in the first year of the five-year plan), d) draft-estimate documentation approved in the established order with apportionment of complex starts.

For units of housing construction and other non-industrial units for which it is regarded as impossible to develop a nominal list of constructions in the five-year plan, the volume of commercial construction output in the five-year plan (divided into years) can, as an exception, be determined by proceeding from the planned volumes of contract construction-assembly projects and the specific cost, in terms of natural indicators (cubic meters of the general area of housing units, school sites, etc.) per unit-measure of units put into operation.

In the annual plans, the yearly quotas for commercial construction output which have been set by the five-year plan are made more concrete and in certain cases specified more exactly.

At the basis of the development of annual plan drafts for commercial construction output are the quotas for putting into operation production capacities and fixed capital that have been established for the given year in the five-year plan with a view toward their more precise concretization and specification; precise volumes of contract projects; and also the title lists of carry-over and newly begun constructions and the draft-estimate documentation for these constructions which has been approved in the established manner.

11. Production associations, enterprises and other client organizations, in accordance with the forms and indices for the development of five-year and annual plan drafts that have been established by Gosplan, and in accordance with the instructions given for their forms, develop proposals for the carrying out of construction-assembly projects with regard both to the volume of commercial construction output and to the volume of contract projects; they forward these proposals (protocol orders) to the industrial construction-assembly associations, trusts (or other equivalent organizations) acting as contractors.

The above proposals are reviewed by contract construction organizations (industrial construction-assembly associations, trusts) jointly with their clients.

On the basis of the protocol orders that have been reviewed, the clients and contractors draw up plan drafts for commercial construction output, determine the volume of contract projects and present them (together with the protocol orders, completed in the established manner) to their superior organizations.

12. The union republic ministries of the union republics, all-union construction associations, the chief territorial (oblast', kray) construction administrations of the USSR ministries and the republic ministries and departments which carry out construction assembly projects, in conjunction with the client republic and union republic ministries and departments of the union republics, oblispolkoms (krayispolkoms) and enterprises under union authority, examine the protocol orders and plan drafts for commercial construction output and volumes of contract work prepared by the subdepartmental enterprises and organizations, make the necessary corrections in them, and determine the volumes of commercial construction output and volumes of contract projects for each construction for the planned year.

The consolidated protocol orders, completed in the established fashion and containing both the proposals that have been agreed upon and separate issues upon which the two sides were unable to reach agreement, and also consolidated plan drafts, prepared on the basis of these protocol orders, for commercial construction output and volumes of contract projects, are forwarded by the above client and contractor ministries and departments and enterprises under union authority to the ministries and USSR departments and to the union republic councils of ministers according to their status in the hierarchy.

Moreover, the union republic ministries of the union republics, acting as contractors, also present consolidated plan drafts for commercial construction output and volumes of contract projects to the appropriate councils of ministers of the union republics.

13. The all-union and union republic ministries and USSR departments and union republics, as clients, present in the established manner the USSR construction ministries with protocol orders for fulfilling the commercial construction output and contract projects, indicating for each construction project the volumes of these indices in a proportion, upon which the subordinate client ministries, departments, enterprises and organizations are in agreement with the contractor union republic ministries of the union republics (the main construction administrations and all-union construction associations).

The USSR construction ministries, together with the client ministries and USSR departments and union republics review the aforementioned protocol orders for the fulfillment of contract projects and when necessary introduce into them more specific details taking into account the agreed-upon general project volumes for construction projects.

The consolidated protocol orders, drawn up by client ministries, USSR departments and union republics in strict accordance with the planning period limits on construction-assembly projects that have been established for them, are presented to Gosplan of the USSR.

At the same time the ministries, USSR departments and union republics present USSR Gosplan, in accordance with established forms and indices, with the consolidated plan drafts of commercial construction output and proposals for volumes of contract projects, which have been developed on the basis of mutually agreed-upon protocol orders.

14. The councils of ministers of the union republics, in order to coordinate the plans for capital construction with the capacities of construction organizations and labor resources, develop and present to USSR Gosplan and the appropriate USSR ministries five-year and annual plan drafts for contract projects to be carried out by the union-republic ministries of the republics. The above plan drafts are reviewed by USSR Gosplan during the development of contract project plans together with the plan drafts presented by USSR ministries for the realization of construction assembly projects.

15. Volumes of commercial construction output for units, structured on a quota system, are determined, at all stages in the development of the plan draft, by the chief contracting organization doing the construction, proceeding from the volumes and deadlines, stipulated in the draft documentation, of quota transfers for capital investment and construction assembly projects. Upon approval of the plan, the volume of commercial construction output is refined on the basis of the putting into operation of capacities and volumes stipulated in the draft plan, taking into account those limits on construction assembly work which have in fact been imposed. Moreover, if the ministries, USSR departments and union republics plan to effect a transfer of capital investment in the quota-sharing procedure, they must review the volumes of contract projects directed toward these goals in proposals (orders) that are to be forwarded to the appropriate contractors, and which indicate commercial construction output volumes.

When the special purposes and extent of quota transfers have not been determined during the development stage of five-year plans, then the ministries, USSR departments and union republics which are carrying out the quota transfers must ensure that they provide the necessary volumes of contract projects, at the cost of general contract project volumes, established for them vis-a-vis the given contractor in the five-year plan for the year in which the transfers are to be carried out, and also at the cost of resources for contract project volumes held in reserve by the ministries, USSR departments and union republics in the established manner.

16. Ministries, USSR departments that carry out construction-assembly projects, and union republics, proceeding from the plans for commercial construction output and the established over-all volumes for contract

projects that have been approved for them, approve and, in the established manner, present to the subdepartmental construction-assembly organizations the deadlines that have been set, the volumes of commercial construction output for enterprises and units leased to clients and over-all commercial construction output volumes (allocated to the various contractors), and also commercial construction output volumes to be fulfilled by internal resources, with quarterly allocations in annual plans; and establish for the above organizations over-all volumes for contract projects (allocated to the various contractors) and contract project volumes to be fulfilled using internal resources.

17. Quotas for commercial construction output volumes for subdepartmental associations, enterprises and organizations acting as clients are established as follows:

a) USSR union republic ministries, in accordance with the commercial construction output volumes that have been set for them in the plans of the appropriate ministries and departments that carry out construction-assembly projects, announce to the union republic ministries and departments of the union republics the commercial construction output volumes, together with allocations of the above volumes among construction projects, units and executors, and also directly approve quotas for commercial construction output volumes for subdepartmental industrial associations, enterprises and organizations.

Quotas for commercial construction output volumes for industrial associations, enterprises, organizations, subdepartmental union republic ministries and union republic departments are approved by these ministries and departments on the basis of volumes which they have received from superior agencies.

b) USSR ministries and departments (with the exception of USSR union-republic ministries), in accordance with the commercial construction output volumes that have been set for them in the plans of the ministries and departments carrying out construction-assembly work, approve for their subordinate organizations, associations and enterprises quotas for commercial construction output volume, which quotas will be fulfilled for them by contracting organizations; the quotas are given with allocations among the various construction projects, units and executors acting as contracting construction-assembly organizations.

c) The method for approving quotas for commercial construction output volumes for industrial associations, enterprises and organizations, subordinate to republic ministries and departments, is established by the councils of ministers of the union republics.

18. The commercial construction output volumes which are approved and the contract project volumes which are established for individual construction projects and units must correspond to the volumes agreed upon

in the protocol orders; where there is disagreement, they must correspond to the volumes accepted by superior agencies and USSR Gosplan.

III. Altering Commercial Construction Output Plans as the Result of Yearly Work Totals.

19. Alteration of the approved annual plans for commercial construction output for construction projects and units may be carried out by USSR ministries and departments and by councils of ministers of the union republics in connection with the preceding year's plan fulfillment totals and in accordance with existing legislation.

20. Industrial associations, enterprises, organizations, acting as clients, and industrial construction-assembly associations, trusts and other equivalent contracting organizations, jointly draw up, sign and forward, no later than February 1 of the planning year, to their superior organizations (in the hierarchy) proposals for altering the commercial construction output volumes, which have been approved in the plan, in connection with the preceding year's plan fulfillment totals, and also in connection with refinements of the quotas for putting industrial units into operation, the title lists of which are approved directly by USSR ministries and departments and by the council of ministers of the union republics. The same applies for non-industrial units.

The above proposals are presented in the form shown in Appendix No 1 to the present Methodological Instructions. The method and deadlines for reviewing these proposals by superior organizations, within the framework of their own systems, is established by USSR ministries and departments and councils of ministers of the union republics.

21. USSR ministries and departments, acting as clients, and USSR ministries acting as contractors, and the council of ministers of the union republics, jointly review the proposals which have been presented by the subdepartmental enterprises and organizations, and prepare consolidated proposals for altering the commercial construction output volumes which have been approved in the plan. After all the parties have signed, they present them no later than 15 February to USSR Gosplan in the form introduced in Appendix No 2 to the present Methodological Instructions.

22. USSR Gosplan examines the proposals received from the USSR ministries and departments and from the councils of ministers of the union republics and, in the established manner, introduces modifications in the plan for commercial construction output for the plan year and informs the appropriate USSR ministries and departments and the councils of ministers of the union republics of these modifications.

USSR ministries and departments and councils of ministers of the union republics, which carry out construction assembly projects, send, no later than two weeks after the modifications have been introduced by Gosplan, the adjusted quotas for commercial construction output volumes to their subdepartmental construction-assembly organizations.

USSR ministries and departments and councils of ministers of the union republics, acting as clients, provide their subordinate associations, enterprises and organizations with the modified quotas for commercial construction output volumes, within the same two weeks.

Appendix No 1 to the Provisional Methodological Instructions for Commercial Construction Output Planning.

MODIFICATIONS in the approved volumes of commercial construction output in connection with the preceding year's plan fulfillment totals for construction-assembly organizations and construction projects.

Client _____

(Association, enterprise, organization)

Contractor _____

(Association, trust)

(in thousands of rubles)

approved plan	refined plan	modifications (+ increase - decrease)
------------------	-----------------	---

I. For government
capital investment--
total

a) for general
contracts--
total including
construction
projects listed
separately

b) for direct
contracts--
total including
construction
projects listed
separately

II. Using assets of
social organizations--
total

(with the same division)
and so forth for all
sources of financing

Commercial construction output volume for enterprises and units leased to the client.

Overall commercial construction output volume.

Appendix No 2 to the provisional Methodological Instructions for commercial Construction Output Planning.

MODIFICATIONS in the approved commercial construction output volumes in connection with the preceding year's plan fulfillment totals for USSR ministries and departments and councils of ministers of the union republics.

Client _____

Contractor _____

(in millions of rubles)

	approved plan	refined plan	modifications (+ increase - decrease)
I. For government capital investment--total			
Including:			
a) for general contracts			
b) for direct contracts			
II. Using assets of social organizations--total			
Including:			
a) for general contracts			
b) for direct contracts			
III. Using kolkhoz assets--total			
Including:			
a) or general contracts			
b) for direct contracts			
IV. Using assets of ZhSK (for general contracts)			
V. Using assets for capital repair and other projects (for direct contracts)			
VI. For subcontracts			

The volume of commercial construction output for enterprises and units leased to clients.

Overall volume of commercial construction output.

9623

CSO: 1821

CONSTRUCTION

BASES FOR FUTURE DEVELOPMENT OF RURAL CONSTRUCTION

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 6, 1980 pp 3-4

[Article by S. L. Dvornikov, first deputy USSR minister of rural construction: "Peculiarities and Directions of Development of the Production Base for Construction in USSR Minsel'stroy (Ministry of Rural Construction)"]

[Text] The Communist Party and the Soviet Government are constantly paying attention to the upgrading of agriculture. The party's strategic task in regard to the agrarian question--reliably supplying the country with raw materials and with industrial and agricultural products--is being solved on the basis of long-term programs for strengthening the supply and equipment base for agriculture, acceleration of the pace of mechanization, the application of chemicals, land reclamation, and the integrated buildup of rural communities with well-appointed apartment houses and buildings for cultural and domestic-services purposes. The execution of these major tasks for a further upgrading of agriculture is becoming possible thanks to the constant improvement of capital construction in the countryside.

Rural builders are erecting agricultural-production facilities, grain elevators, enterprises of the milling, hulled-grain and mixed-feed industries, housing, and facilities for cultural and domestic-services purposes. In the years that have passed since creation of the rural-construction sector, a production base that supports a constant increase in the construction program in the countryside has been created practically from the beginning.

In the recent past the production of new progressive and lightweight structure, which involved the reconstruction and expansion of existing enterprises and the construction of new ones, was organized. Capacity for the production of porous aggregates, lightweight concrete items and, based thereon, capacity for large-panel housing construction have been created from scratch. Enterprises for producing glued-wood structure have been built, and a mechanical-repair base for servicing construction machinery and mechanisms has been established.

As with any other branch of the economy, rural construction has its distinctive features and peculiarities, which govern development of the in-house production base.

Industrial enterprises of the rural construction industry should provide complete sets of items and structure to all types of agricultural-production, industrial, housing and public-building construction.

The regional principle for siting enterprises predominates in developing the base for rural construction, except for the output of special products. The regional nature of rural construction restricts the specialization of enterprises to definite kinds of production facilities. These are, primarily, grain-elevator building, the production of electrical-installation and sanitary-equipment products, metal constructional structure, operating equipment, and molds and tooling. These production facilities are organized in the form of large interoblast (or interrepublic) enterprises.

The necessity for supporting a constantly changing structure of construction and installing operations with different constructional articles and structure dictates the need for the rapid technological restructuring of production.

In 1980 USSR Minsel'stroi's capacity for manufacturing prefabricated reinforced concrete was 13.1 million cubic meters. The capacity for fully prefabricated housing construction was brought up to 2.5 million square meters of total area and, for grain-elevator building, up to 1,047,000 cubic meters.

In order to improve qualitatively the production base for grain-elevator building organizations, an increase in the output of effective stressed and reinforced members, the introduction of lightweight structure, and the organization of construction of a portion of the grain-elevator silos with the use of metal structure were called for. Enterprises for producing complete sets of industrialized structure for the erection of agricultural-production buildings totaling more than 13.5 million square meters in area were established.

Conveyorized production with heat treatment of molded items in slit chambers is being introduced at plants for prefabricated reinforced concrete that are being rebuilt or expanded. When enterprises are reequipped with machinery, preference is given to the introduction of low-frequency resonance-vibration surfaces, concrete layers with smoothing-out arrangements, lines for preparing molds for concreting, and cantilever cranes for placing reinforcements and for removing the finished products.

USSR Minsel'stroi has done work to unify the dimensioning schemes of main and auxiliary buildings for agricultural purposes. Prefabricated reinforced-concrete and other structure have been brought into the catalogs of the "rural" series, and they are distinguished from industrial items by lesser materials-intensiveness and labor-intensiveness in their manufacture and installation.

The main course in developing the rural construction base is a rise in the level of prefabrication on the basis of the manufacture and delivery of fully outfitted buildings and structures and a systematic increase in the share of fully prefabricated construction. In 1980 fully prefabricated construction is 82 percent of the total work volume. One of the cardinal ways to solve this question is the creation of rural construction combines (SSK's) and rural housing-construction combines (SDSK's), which are designed to produce complete sets of lightweight industrialized structure with a high degree of factory preparation, and the speedy flow-line type erection therefrom of agricultural-production buildings and facilities for housing and cultural and personal services that are ready for operation.

The absence of heavy, coarse aggregate in some parts of the country and the striving to reduce the weight and materials-intensiveness of constructional structure have placed on the agenda the question of **Introducing lightweight-concrete enclosure and load-bearing structure [printed in boldface].**

A substantial growth in the production of lightweight-concrete structure requires a quantitative and, especially, a qualitative growth in the production of porous aggregate, primarily keramzit. A quantitative growth in keramzit-gravel production is provided mainly by raising the utilization level of existing production capacity. We have large unused reserves here. Raising the quality of output is being achieved, thanks to the introduction of available experience and the technical developments of our leading scientific-research institutes.

Aside from development of the branch for producing prefabricated reinforced concrete and artificial porous aggregate, USSR Minsel'stroy is paying major attention to the development and modernization of wood-processing output. The ministry has at its disposal capacity for producing carpentry products, which, on 1 January 1980 was 6.7 million square meters. Sawmill and wood-processing enterprises are being developed and rebuilt in accordance with a long-range plan that takes into account the concentration and specialization of production facilities, as well as rises in the level of factory preparation of the articles produced and the level of utilization of waste.

In recent years a new branch has been created in the USSR Minsel'stroy system—the production of glue-wood structure, the capacity of which has passed the 100,000 cubic meter mark. In 1979, 95,000 cubic meters of glued-wood structure were produced, from which agricultural buildings totaling 370,000 square meters in area were built.

The ministry is doing much work to improve the use of low-grade wood and waste from wood processing. In 1979 departments for producing chipboard were introduced at large DOK's [wood-processing combines] in Vologda, Revda and Petropavlovsk (Kazakh SSR). The main area that the ministry adopted for the use of chipboard was the manufacture of built-in furniture and floor slabs.

The ministry is assigning a special place in 1980-1985 plans to the problem of improving the use of waste by reprocessing it into wood concrete.

Development of the country's construction-industry base is inseparably connected with work to raise the quality of products produced. The ministry has worked out and issued a number of standardizing documents with a view to raising the quality and degree of factory preparation of structure and parts. Each year measures are developed and concrete tasks established for raising the quality of the articles produced.

At present industrial output of the first quality category produced by the ministry's subordinate organizations and enterprises has reached 82 percent of the total realized output that is subject to certification.

It is planned to continue during the Eleventh Five-Year Plan substantial development of the base of specialized organizations--mechanical-repair plants, enterprises for the production of semifinished items for assembly, compact purification structures, repair enterprises, mechanization administrations and motor pools.

In order to provide engineering direction for construction-industry enterprises, to create effective production facilities, and to increase labor productivity substantially in construction based upon the output of articles fully prepared at the factory, the following tasks must, in the ministry's opinion, be fulfilled:

USSR Gosstroy, with the forces of design and scientific-research organizations--to do work to reduce substantially the products mix of prefabricated and, especially, reinforced concrete products and structure and embedded parts and to unify plumbing and electrical-installation items;

Minstroydormash [Ministry of Construction, Road and Municipal Machine Building]--to satisfy more completely during the Eleventh Five-Year Plan the demand for effective operating equipment, machinery, means of minor mechanization, and molds and tooling, including mobile installations for the upgrading of quarried materials for use directly at the plants for making reinforced-concrete articles and highly productive lines for straightening and cutting die-rolled reinforcement steel in coils up to 16 mm in diameter;

USSR Ministroyaterialov--to provide enterprises that make prefabricated reinforced concrete with highly active cement that does not require heat treatment;

To greatly increase the amount of production of superplasticizers as a base for vibration-free technology and hardening of concrete under natural conditions; and

To develop and provide for the manufacture of effective standard equipment (conveyor lines for decorating and lapping items, and so on) for organizing the output of articles fully readied at the factory.

Bringing to fruition the entire set of intended measures connected with the accelerated development of an industrial base for rural construction will enable USSR Minister's to constantly increase construction in the countryside and to carry out successfully the party's and state's tasks for restructuring the countryside.

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CSO: 1821

CONSTRUCTION

RURAL CONSTRUCTION PROGRESS IN KAZAKH SSR

Minister Interviewed

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 22 Jun 80 p 2

[Interview with Kazakh SSR Minister of Rural Construction Kurgan Murkhanovich Musin: "Villages Are Becoming Towns"]

[Text] The concept of "rural construction" appeared relatively recently in Kazakhstan--not much more than a quarter of a century ago, when assimilation of the virgin and fallow lands began. Leonid Il'ich Brezhnev wrote in his book, "Tselina" [Virgin Land]: "Our record in the CPSU Central Committee about what the republic had at its disposal when subjugation of the virgin lands was started has been preserved. Forces were dispersed, and more than 30 construction organizations of low operating capacity were subordinated to various ministries and agencies. All of them together had 59 concrete mixers, 6 tower cranes, 58 conveyors, 5 automotive loaders and 5,700 workers."

But nowadays the Kazakh SSR Ministry of Rural Construction system has about 40 construction and installing trusts and more than 400 mobile mechanized columns that are equipped with the most modern machinery. In the last 10 years alone the industry's workers have turned over for operation housing that totals about 15 million square meters in area, a large number of children's institutions, and facilities for cultural and personal-services purposes. The largest grain elevators, mixed-feed plants and livestock-raising complexes have been built....And the scale of this work grows daily--during the current five-year plan rural builders are assimilating 2.9 billion rubles of capital investment.

Republic Minister of Rural Construction Kurgan Murkhanovich Musin gives KAZAKHSTANSKAYA PRAVDA an interview about the work that has been done to rebuild the countryside radically.

KAZAKHSTANSKAYA PRAVDA: When major anniversary dates are observed, then "the current period and the past period" are usually compared. And we will not deviate from this tradition on the threshold of a celebrated event--the 60th anniversary of the Kazakh SSR and the Communist Party of Kazakhstan. What, in your view, distinguishes the face of the modern village from the old one?

The minister: Making a direct comparison would be unfair: I have had occasion to visit old villages, the majority of which have now disappeared into the distant past. What particularly struck the eye was the absence even of elementary planning: narrow, curved and dusty so-called streets, houses made of adobe or, more rarely, of logs, broken-down roads that had never seen asphalt, and little greenery. The housing was devoid of the conveniences, there were no sewers or waterlines or systems for central heating.

But ride today, for example, into Krasnyy Flag village in Tselinogradskaya Oblast. It has been built up mainly with one-story and two-story apartments, with units on two levels. Private plots in front and construction necessary for the conduct of auxiliary activities are called for. At the same time, two-story eight-unit apartment houses are being erected here--they have been sited in groups and form a "framework" for children's playgrounds and recreation zones.

With regard to layout, the structure of the residential zone, as with the best examples of urban construction, calls for convenience of transport and pedestrian connections of the housing tracts with the social, cultural and personal-services complexes and the production zone. The group of social buildings is the center of the layout composition.

All types of utility lines and services have been planned and laid down, and the water lines and sewer systems are operating. A reliable supply of electricity has been provided from the state electric-power grid. There is a local ATS [automatic telephone exchange]. The streets and sidewalks have been asphalted, and the radio-diffusion network has been set up. All local residents watch Central Television programs.

So it is not easy to call Krasnyy Flag a village: it is a real modern town. Therefore, as I said, it is unfair to compare the past and the present in the given case. From the spontaneous buildup, wherein rural residents make themselves at home, conforming with the experience of their grandfathers, and using those available materials that are at hand, we have converted to the system of a firm state plan, centralized supply, and maximum mechanization of the work. And this has led to a radical change in the face of our villages.

KAZAKHSTANSKAYA PRAVDA: Consequently, the example of Krasnyy Flat settlement is not an exception, but the rule?

The minister: That is absolutely true. Tens of kolkhoz and sovkhos settlements can be named whose buildups meet the most modern requirements.

Among them are Sovkhoz Zhdanovskiy of Severnaya Kazakhstanskaya Oblast, Sovkhoz Trudovoy Pakhar' of Dzhambul'skaya Oblast, sovkhozes Kazakhstan and Tselinnyy of Chimgentskaya Oblast, Sovkhoz Krasnoyarskiy of Kokchetavskaya Oblast and many others. Our ministry was established 15 years ago, and, during this time, rural builders have taken part in the buildup, expansion and rebuilding of almost 2,000 communities, which are located in various climate zones.

The main task that the party and government have set before the branch's workers is maximum improvement of the working and living conditions of rural residents. And this task has become for us the main one. In confirmation of what has been said, I refer to this case. After completion of the development of Sovkhoz Zhdanovskiy, which is in North Kazakhstan, a full set of institutions for cultural and domestic purposes will operate here: a club that accommodates 400, dormitories for small family units, a combine for personal services with a dining hall and a shopping center, and a Pioneers' Palace with a swimming pool. If the housing and facilities for production purposes are added to this, then we have before us a bright example of the transformation of a village into an agricultural town, where everything is subordinated to the main purpose: to present sovkhov workers with maximum opportunities for full and intelligent application of their energies.

An All-Union conference dedicated to advanced experience in the layout and buildup of rural communities was held recently in Krasnodar. And it was said there that the example of Sovkhoz Zhdanovskiy can be a singular standard for an integrated buildup and civic improvements. But not just Sovkhoz Zhdanovskiy. In recent years more than 500 kolkhozes and sovkhozes of Kazakhstan have taken part at All-Union inspection-contests for the best development. VDNKh SSSR [Exhibition of Achievements of the USSR's National Economy] awards were given to 67 of them.

KAZAKHSTANSKAYA PRAVDA: But let's take another look back. The republic's Ministry of Rural Construction was established 15 years ago. What paths have the branch's workers taken to their present summits?

The minister: In order to take an exact reading, it is necessary to take, not 1965, but the start of the development of the virgin and fallow lands. Leonid Il'ich Brezhnev writes in the book, "Tselina": "...The Virgin Lands are not just a plowed field. They also include housing, schools, hospitals, kindergartens, nurseries and clubs, plus new roads, bridges and airports, plus livestock-raising structures, grain elevators, warehouses and plants—in brief, everything that is necessary for a normal life for the population, for modern developed agricultural production."

What Comrade L. I. Brezhnev was talking about, and much more that he did not mention, lay ahead; all of this was still to be built. The republic's rural construction workers, like the first Virgin-Lands pioneers, also began with the first stake. The scope of the operations was enormous, causing a truly radical change that could be completed thanks only to the constant concern and assistance of the party and the government. Right

now a hundred thousand people are working in the ministry's subdivisions. More than a billion rubles have been invested in developing rural construction-industry enterprises.

KAZAKHSTANSKAYA PRAVDA: The further intensification of agricultural production required the creation of large complexes. Previously the village had not known such structures, which introduce grandness of scale and new shapes into the rural landscape. To what extent do these objects meet modern requirements in their constructional solutions, layout and architecture?

The minister: Actually, the face of the village is being changed before one's eyes in this respect also. Visit, for example, Ak-Kul' settlement.

Whichever direction you come from, you see for many kilometers the white giants of the local grain elevator that was erected by a Tselinogradelevatormel'stroy [Trust for the Construction of Grain Elevators and Grain-Milling Enterprises in Tselinogradskaya Oblast] collective. Each silo hull accommodates 31,000 tons of grain. This skyscraper of the steppes is supplied with the newest equipment, which enables the reception, cleaning, drying and loading of graded grain into freight cars to be performed simultaneously. One cannot describe the settlement now without the grain elevator--the country's largest.

It is just as impossible to describe Sovkhoz Dzhetygenskiy in Alma-Atinskaya Oblast without the large cattle-fattening complex. Rural builders have recently introduced into operation such large facilities as a poultry plant in Pavlodarskaya Oblast, a cattle-fattening complex in Tselinogradskaya Oblast, grain-elevator capacity in Dzhambul'skaya, Aktyubinskaya and Vostochno-Kazakhstanskaya oblasts. The countryside had not known of such construction projects before.

KAZAKHSTANSKAYA PRAVDA: With the growing scale, pace and specificity of rural construction in the republic, and with the republic's vast expanses, questions of raising the technical level of the production base are acquiring decisive importance. What course are the branch's workers following?

The minister: In recent years a program for developing a network of rural-construction combines has been implemented in Kazakhstan. Previously we had one enterprise of this type--the Kapchagay SSK [Rural Construction Combine]. But now two more are operating successfully--in Petropavlovsk and Semipalatinsk. The republic's Minsel'stroy is striving to develop a network of specialized enterprises not only through the erection of new production facilities but also by rebuilding existing ones. To a great extent this will enable rural construction to convert to an industrialized basis. By the end of the current five-year plan the level of fully prefabricated construction will, for the ministry as a whole, reach 52 percent. This is a great step forward.

KAZAKHSTANSKAYA PRAVDA: These measures are aimed at improving construction production. But it is known that the success of any job is made possible by personnel.

The minister: Today people whose names are well known not only within the republic but also in the country are working within our system. They earned this fame by their deeds. Thus, at the start of the current five-year plan, a movement was born in the rural Kazakhstan environment, which was named "the integrated millionaire brigade movement."

The first such collectives, under USSR State Prize winner L. Kharsika, Kazakh SSR State Prize winner A. Krin and Distinguished Builder of the Republic B. Zakharov, were organized in Yuzhelevatormel'stroy. They were usually entrusted with the erection of a facility "from the below-grade work to the final turnover of the completed facility," and established a firm annual plan which, as a rule, exceeded a million rubles.

The first consolidated cost-accounting brigades justified themselves completely, and right now their followers are operating in many other trusts. Several times I have had to visit such collectives, and each time I have noted with satisfaction the growing level of the people's knowledge.

Excellent specialists, masters of their business, have come to maturity at the republic's construction projects. Among them are V. Nosik--brigade leader of Tselinogradelevatormel'stroy, Kh. Musina--brigade leader of Petropavlovsksel'stroy [Petropavlovsk Rural Construction Trust], T. Abrosimov--brigade leader of Semipalatinsk'stroy [Semipalatinsk Rural Construction Trust] and many others. It is by the efforts of these people that kolkhoz and sovkhoz settlements are being raised up, apartment houses and palaces of culture are growing, and the land is being transformed....

Grain Elevators

Moscow STROITEL'NAYA GAZETA in Russian 27 Jun 80 p 2

[Article by V. Romanov, manager of Yuzhelevatormel'stroy Trust (Alma-Ata): "The Precision of Choice"]

[Text] Among the facilities due for startup in the concluding year of the five-year plan is the Zholaman grain elevator. A Yuzhelevatormel'stroy collective should introduce the first phase of the complex, which is designed to receive and process 62,000 tons of grain, before the start of the large-scale harvest. The job is urgent, and there is no doubt of any kind that it will be achieved. Although L. Vitkovskiy's integrated consolidated brigade, which undertook the construction project under contract, does have its difficulties.

The fact is that the Zholaman elevator is in many respects an unusual facility. Here for the first time in our practice, the latest achievements of science and advanced experience are being used to the maximum. In particular, the designers proposed and the builders have used prefabricated footings, the complete sealing of butt joints, a rational apportionment of

prefabricated elements, and other innovations. A portion of them was tried out during construction of the Semipalatinsk, Dzhambul and Berlik grain elevators. And an interlocking shell of auxiliary structures will be the first not only in the republic but also in the country.

It stands to reason that the originators of the design--specialists of Gosniisredazpromzernoprojekt [State Scientific-Research Institute for the Design of Grain-Industry Enterprises in Central Asia]--have extended and are extending great assistance to the builders in solving a number of complicated problems. Chief design engineer A. Turmagambetov, group manager Yu. Strukov and others constantly visit the job site. And it is due in no small part to their services that erection of the elevator is proceeding smoothly.

Our creative collaboration with the institute has been going on for more than 10 years. During this time we have found out each other's capabilities and have become accustomed to working in constant and close contact. Our work during the erection of elevators with silo shells of 27,000 tons capacity was especially fruitful. The solutions proved to be so successful that the construction of such elevators was begun everywhere in the republic.

The example of erection of a silo shell of 33,000 tons capacity at the Semipalatinsk grain elevator was characteristic in this regard. The designers proposed to reduce the height of the subsilo story from 6 to 3.6 meters and thereby enlarge the silo portion by 8.4 meters. Simultaneously, it was decided to use here an economical apportionment of prefabricated reinforced-concrete members. The proposal interested us. After careful study of the drawings and calculations, in which the trust's specialists introduced some revisions, Yuzhelevatormel'stroy undertook to carry out the design. All the problems that arose were solved in close mutual action with the design's originators. As a result, the facility was introduced half a year ahead of time and about 400,000 cubic meters of prefabricated reinforced concrete were saved. And the overall benefit of the new design solution was 225,000 rubles.

Yuzhelevatormel'stroy is one of the oldest trusts in the republic. Over a period of many years the collective has been fulfilling the plan in stable fashion, and it has been a winner in All-Union and republic socialist competition. Experience has been gained, and a large detachment of erectors, on whose shoulders lie the solution of the most complex tasks, has been trained. The names of our brigade leaders--USSR State Prize winner L. Kharsika, Kazakh SSR State Prize winners A. Krin, B. Zakharov, A. Yelinov and L. Vitkovskiy, and many others are widely known within the branch.

Our engineers and erectors introduce many corrections to the design proposals, which help to reduce construction time and to improve quality. Until recently, for example, the use of cast-in-place footings seriously hampered our work. The proportion of manual labor in placing them, especially in the winter, was high. We brought this to the attention of the designers. The necessary calculations and documentation were worked out

by joint forces. And today, we suffer no grief. The trust has practically converted to the laying of prefabricated footings. We use four types, for various categories of soils. We manufacture the blocks at the factory and install them at any time of the year.

The design of the shell of interlocked auxiliary facilities also was developed by joint efforts. It is known that, with an elevator there are tens of different facilities, where auxiliary operations are placed. We posed the task of joining at least some of them together. They are already being erected at grain-receiving enterprises in Zholaman and Zhangiz-Tobe [sic]. The laboratories, personal-services premises, scales, transformer substation and repair shops have been placed at each of them. The economic benefit in the given case is not great--about 40,000 rubles for one block. But then we also gain time: the erection of such a shell goes twice as fast as the arrangement of numerous small premises. There is also another gain--now we can widely use existing technology and dispense with labor-intensive bricklaying.

The fruitful collaboration of the builders and designers is being developed and is taking on new forms. Yuzhelevatormel'sstroy engineers and workers are participating in meetings of the institute's engineering council and in other measures. Our ties are becoming ever closer.

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CSO: 1821

METALWORKING EQUIPMENT

FORGING, PRESS INDUSTRY REVIEWED

Moscow KUZNECHNO-SHTAMPOVOCHNOYE PROIZVODSTVO in Russian No 5, May 80
pp 2-6

[Article by D. I. Polyakov, deputy minister of the USSR Machine Tool and Tool Industry: "Forging-Press Machine Building at a New Level"]

[Text] In the Central Committee of the CPSU

On 10 and 11 March a conference of the workers of the machine tool and tool industry was held in the Central Committee CPSU in connection with the decree adopted by the Central Committee of the CPSU and the USSR Council of Ministers "On a significant increase in the technical standards and competitiveness of metal-working, casting, wood-working equipment and tools."

The conference opened with a speech by A. P. Kirilenko.

He stated that the Central Committee of the CPSU considered it necessary to hold this conference to discuss the entire complex of problems related to the full realization of the decree mentioned. It is a large multiplan document that opens up a new stage qualitatively in the development of the Soviet machine tool and tool industry. It is aimed at raising sharply, in the Eleventh Five-Year Plan period, the technical standards and productivity of machine tools, forging-press, casting machines and tools manufactured domestically, and increasing considerably the output of their most progressive types.

"The main idea and the basic content of the decree, to which our conference is dedicated, I would say, is to bring about a revolutionary swing toward improving the design of the produced equipment, raising its technical standards and, on that basis, develop the introduction of progressive technology and highly efficient methods of organizing production into machine building along a broad front."

The problem is that the equipment created be fully in accord with modern achievements of science, the best world practice and be competitive in the markets abroad."

"In creating any new equipment, the first requirement is its high degree of automation."

"The reduction of metal scrap in production depends, first of all, on increasing the output of progressive forging-press and casting equipment that makes it possible to obtain intermediate products with minimal allowances for subsequent machining. Modern achievements of science and technology create real possibilities for this. For example, on the hydraulic presses of the Dnepropetrovskiy Plant, equipped with programmed control and operating in a set with manipulators, large accurate forgings are obtained and up to 30 percent metal is saved."

"I would like to note the extremely responsible and, I would say, honorable role of scientists, designers and technologists in their solutions. We expect that supported by advanced domestic and world experience, they will lead the fight for technical progress and will be its active guides."

"It is impossible to achieve significant progress in machine tool building without providing machine tools, presses and casting machines with programmed control systems based on micro-computers. It is precisely these products that determine in essence the technical standard and the competitiveness of equipment today. Leaders of the Minpribor [Ministry of Instrument Building, Automation and Control System] and Minelektromprom [Ministry of Electronics Industry] must bear the responsibility along with the leaders of the Minstankprom [Ministry of Machine Tool and Tool Industry] for the successful solution of this problem. This applies directly also to the ministers' comrades I. P. Kazanets, P. P. Lomako, L. A. Kostandov, and V. S. Fedorov who must make better provision of the machine tool building industry with high quality metal, industrial rubber and chemical materials."

A report on problems of the USSR Minstankoprom, arising from the decree of the Central Committee of the CPSU and the USSR Council of Ministers, was made by A. I. Kostonsov. He informed the conference that the Board of the Ministry is developing at present, along with academic institutes, VUZ, enterprises and organizations of the related industries, a concrete plan of measures to fulfill the tasks established by the decree on creating new in principle types of machine tools, machines and tools. Machine tool builders received the decree with great enthusiasm and see in it a new demonstration of the constant care of the party and government about the development of the machine tool and tool industry and they will exert all their efforts to implementing the posed problems.

Concrete problems in improving various types of equipment were discussed thoroughly at section meetings on metal-cutting and wood-working machine tools, forging-press machines, casting equipment and tool production in which over 750 persons participated. Suggestions made were coordinated and reported by section leaders -- deputy ministers of Minstankoprom -- V. M. Voyevodin, D. I. Polyakov, G. N. Fedorovskiy and N. I. Sergeyev and the final plenary session of the conference.

In conclusion, A. P. Kirilenko expressed his firm conviction that machine tool builders along with workers of other industries would do everything possible to convert domestic machine tool building into a leading sector of Soviet industry and into a true vanguard of technical progress in the national economy.

(PRAVDA of 12 March 1980).

In March 1980, the Central Committee of the CPSU held a conference of the machine tool and tool building industry to discuss a complex of problems related to the timely implementation of the decree of the Central Committee of the CPSU and the USSR Council of Ministers "On a significant increase in the technical standards and competitiveness of metal-working, casting and wood-working equipment and tools."

This decree opens up a qualitatively new stage in the development of the machine tool and tool industry and is directed toward solving the problems of a sharp increase in the technical standards and productivity of metal-cutting machine tools, forging-press and casting machines and tools, and a significant increase in the output of most progressive types of equipment and high quality tools.

The basic role in increasing the efficiency of machine building production and of the national economy as a whole is played by machine tool building -- the heart of all machine building. On the basis of using improved machine tools, forging-press and casting machines, it is possible to accelerate the growth of labor productivity, save metal, increase product quality and introduce power saving technology.

Machine tool building, the child of the first five-year plan periods became a powerful sector of an industry that produces over 300,000 metal cutting machine tools, forging-press and casting machines every year.

At the conference of workers of the machine tool and tool industry, in connection with the decree adopted by the Central Committee of the CPSU and the USSR Council of Ministers, it was stressed that the technical development of machine tool building is still not being implemented rapidly enough. The design and quality of metal cutting equipment manufactured by the Minstankoprom enterprises do not solve fully the problems of introducing advanced technological processes into the machine tool building production that insure the highest growth of labor

productivity, increase the coefficient of metal utilization and improve the quality of machine building products.

A revolutionary swing is necessary to improve the design of the equipment produced and to raise its technological standard and, on that basis, develop on a broad front the introduction of progressive technology into machine building and highly efficient methods for organizing production. The production of most progressive types of equipment must be increased sharply, in particular, by reducing the output of outdated types of machine tools and machines.

Newly created equipment must be fully in accord with modern achievements of science and the best world practice and be competitive in markets abroad. The basic directions in improving equipment under modern conditions are a high degree of automation, a reduction in the amount of metal used, the creation of unitized systems of machine tools and machines, and improvement in tool supply.

During the last fifteen years, since the October (1964) Plenum of the Central Committee of the CPSU which has become a historic landmark in the life of our party and people, forging-press equipment [KPO] production increased considerably. During that period, the national economy was supplied with over 720,000 forging-press machines, including 485,000 -- by specialized enterprises of the Minstankoprom. Essentially, during the Eighth, Ninth and Tenth Five-Year Plan periods, a greater part of that powerful KPO park was formed which is at the disposal of the national economy.

The greatest increase in KPO production was achieved in the past years of the Tenth Five-Year Plan period. Over 56,000 KPO were manufactured for more than 550 million rubles in 1977. KPO production increased 12% in quantity and 49% in cost compared to 1975.

During the four years of the Tenth Five-Year Plan period over 140,000 forging-press machines were produced for 1.6 billion rubles.

The most important feature of forging-press machine building development during the years of the Tenth Five-Year Plan period is an increase in the share of the volume of KPO production in the total output of metal cutting equipment and the further improvement in the structure of KPO production due to an increase in the ratio of automated equipment in the total output from 15.2% in 1975 to 22.1% in 1979 in quantity, and from 30% in 1975 to 47% in 1979 in cost.

The increase in production and the addition of progressive types of KPO to the park made it possible to increase the volume of metal processed by high, cold, volumetric, cold volumetric and stamping from 11.9 million tons in 1965 to 28 million tons in 1980, which is 26% of the total output of rolled stock; the volumes of reprocessed ingots during this

period increased from 1.2 to 2.8 million tons and of plastics -- from 160,000 to 900,000 tons. At present, the forging-press equipment processes, besides the indicated materials, 45,000 tons of metal powders, produces ten million m³ splint-slab and fiber materials, and reprocesses 30 million tons of metal scrap and a number of other materials by shears cutting, packeting and briquetting.

The KPO share in the total output of metal cutting equipment in the country increased from 15.7% in 1965 to 18.9% in 1978 in quantity and from 19.4% in 1965 to 22.4% in 1978 in cost.

In spite of the advanced development of KPO production compared to the production of metal cutting machine tools and the increasing share of the total volume of metal cutting equipment, the rates of increased production of KPO are still insufficient.

At present, the achieved production volume and the list of KPO produced does not fully provide the industry with its requirements and the technical standard of some types of equipment does not meet modern requirements; therefore, the output of highly productive forging-press machines will increase considerably in the Eleventh Five-Year Plan period. This will provide for the further development of the present progressive trend in the national economy -- increasing the share of highly productive forging-press equipment in the total output of metal-working equipment.

The production of automatic lines at the ministry's enterprises for machine building and metal-working will increase by 40%; automatic and semiautomatic machines for all technological groups -- by more than 58%; special and unit-head machine tools with numerical programmed control -- by 2.5 times; and forging-press automated machines -- by more than double.

There will be an increased output of all types of the traditional group of forging-press automatic machines (metal products, sheet-stamping, etc.), casting and straightening-cutting automatic machines. However, basically, the increase in the output of automated machines will be provided by universal forging-press equipment: mechanical and hydraulic presses, forging machines and hammers, shears and bending machines.

The following will be provided with automation facilities: enclosed, simple action single and double crankshaft sheet stamping presses, enclosed forging multipass rollers, hot stamping crankshaft presses, horizontal forging machines and many types of universal forging-press equipment. Thus, the automation level of the KPO park in the national economy will increase considerably, especially in machine building and metal working, solving thereby not only the problem of raising the productivity of labor, but also solving the problems of increasing labor safety in forging-stamping production.

The output of progressive and promising forging-press machines and automatic complexes with programmed control will increase by several times. The increased output will be accompanied by the expansion of the number of types of this equipment. Equipment complexes with numerical programmed control will be assimilated for cutting sheets 16, 20 and 32mm thick; 110 ton-force hole-punching presses with a turret head with ChPU [Numeric programmed control]; hydraulic machines with ChPU for straightening cylindrical shape parts; 2000 and 3150 ton-force hydraulic forging complexes, equipped with automatic manipulators; radial-roughing machines with programmed control; and automatic complexes for hot volumetric stamping using hot stamping presses.

The decree defined concrete problems on a considerable increase in the output of the most promising KPO with ChPU and automatic manipulators with programmed control which will be supplied in a set for automation work. It should be noted that a great deal of attention is being devoted to the development of production of this equipment in the industrial sector.

The creation and assimilation of production of KPO with programmed control were started in the Ninth Five-Year Plan period. Seventeen type-sizes were assimilated and 152 KPO units with programmed control were produced. Seventh-five type-sizes of KPO with programmed control were manufactured during the Tenth Five-Year Plan period and a total of 1900 units of KPO with programmed control will be produced in the next five-year plan period.

The decree specifies a considerably increase in the output of machines and complexes with programmed control.

This task specifies supplying equipment to the following: the Chinkentskiy PO [Production association] (hole-punching presses for stamping panels), the Azovskiy PO (sheet-bending presses and complexes using sheet shears), the Nelidovskiy Plant (sheet-bending machines), the Odesskiy PO (pipe-bending and casting machines), the Orenburgskiy PO (straightening presses), the Voronezhskiy PO KPO (perforation and shape-bending machines), the Dnepropetrovskiy PO (forging complexes with manipulators) and other plants and associations.

Without exception, the managers of all production associations, enterprises, plants and organizations must take all necessary measures for the maximum output of machines with programmed control for the entire product list of machines. This requires strengthened design departments, the organization of corresponding services on developing and using modern electric motor systems and feeds using electronic devices, microprocessors and microcomputers. Measures must be taken to strengthen services with highly skilled specialists and the present cadres must be correspondingly trained and retrained.

Such a considerable quantitative increase of KPO with programmed control requires a qualitatively new approach to solving problems of producing the machines and the organization of their servicing, as well as other problems.

The output of very promising automation facilities -- automatic manipulators for forging-press machines -- must increase six-fold in the Eleventh Five-Year Plan period. The plants of the industrial sector will supply them in automated complexes using single crankshaft open and enclosed presses, hot stamping, punching screw and other presses. To a certain extent, automatic manipulators will fill the gap in automating loading and unloading single sheet or volumetric blanks.

It is planned to increase the output of forging-press automatic lines by 1.5 times. The number of types of lines produced by plants and PO of the industry will expand considerably. Automatic lines for finishing coiled sheet material, sheet stamping, hot volumetric stamping -- this is the list of the basic line groups which will be produced. A new variety of automatic lines will be developed -- lines created on the basis of automated complexes (modules) using presses with automatic manipulators.

At present, the basic users of forging-press automatic lines are enterprises of Minavtoprom [Ministry of Automotive Industry], Minchermet [Ministry of Ferrous Metals], Minelectrotekhprom [Ministry of Electrical Equipment Industry] and Minsel'skozmash [Ministry of Agricultural Machinery].

It is planned to create and assimilate special design lines for producing motor vehicle parts using low-waste technology according to the ZIL [Gor'kiy Plant imeni V. I. Lenin] PO.

Highly productive lines are being created on order by the Minchermet for the production of mass use parts on RR transport -- clamp and insertion bolts, rail anchors and other parts.

A great number of automatic lines for processing by pressure will be created for the Minsel'skhomash for the production of complicated parts for soil-working machine tools, plowshares and plow standards, moldboards, cultivator lines and blades, harrow tines, etc. This will be an important contribution to increasing the production of machines for agriculture.

These tasks will be implemented by the Voronezhskiy PO KPO and TMP [expansion unknown], the Azovskoye PO KPO, the Odesskoye, Dnepropetrovskoye and Ryazanskoye PO, the Barnaul'skiy and other plants. However, the number of plants that produce automatic lines and the number of types of lines produced must be expanded considerably.

All plants and PO must change over to producing automatic lines.

All plants and PO that manufacture metal products equipment must also create automatic lines for the entire cycle of producing finished products.

For this purpose, managers and collectives of enterprises and organizations must, in the shortest possible time, extensively analyze the technical standards of the products manufactured, take into account the experience accumulated in our industry and abroad, and take measures to create designs and organize the production of automatic lines that provide maximum productivity and high quality products.

The government decree poses before press builders the problem of producing sets of high productivity equipment of high plant and installation readiness for manufacturing crankshafts and camshafts, connecting rods, valves, gears, spline shafts, bearings, various components for motor vehicle wheels and tractors, large size body parts and other parts. The sets must be created not only for one type-size, but for a number of parts, i.e., readjustable sets for a group of parts of one item.

Design bureaus, plants and PO of the industry are faced with the problem of producing in the very near future, sets of highly productive equipment within automatic lines controlled by computers capable of fulfilling all technological operations in manufacturing important parts, widely used in machines and equipment, with the least waste of metal.

Taking into account modern trends in developing machine building to increase the unit power of machines, sets of machines and apparatus, it is planned to increase by 1.5 times the output of heavy and special design forging-press machines.

In the Eleventh Five-Year Plan period, it will be necessary to assimilate about 250 new type-sizes of automated equipment, forging-press automatic machines, automated complexes, as well as high productivity sets of equipment.

There will be a considerable saving in metal and a higher productivity of labor in machining shops by increasing the output of the forging-press machines for obtaining accurate intermediate and final products. The output of crankshaft hot stamping presses must almost double; the output of presses for cold extrusion should increase by 2.5 times; the output of punching presses -- by more than 1.5 times and the output of automatic presses for manufacturing products from metal powders -- by 1.8 times. The list of types of equipment for obtaining precise intermediate products will be expanded by the use of crankshaft double-action (for stamping in detachable dies) hot stamping presses, automatic presses for cutting finished blanks of new type-sizes, automatic multi-position presses for cold extrusion and other equipment.

To increase technical standards considerably, measures are being outlined for raising the productivity of forging-press machines by 1.4 to 1.5 times and the reliability and life of the produced machines in operation -- by 1.4 to 1.6 times. The solution of these problems will be provided by creating more perfect KPO designs, new in principle types of automatic equipment, typical broadly universal automated complexes, including automatic industrial manipulators (robots), forging-press machines with programmed control, by automating auxiliary operations and further increasing the quality of machine manufacture by using progressive technological processes, implementing measures to increase the service life until capital repairs of the basic types of machines, and increasing sharply the share of the highest category of quality products in the total KPO output.

In order to increase the efficiency of production of forging-press machines, the following is planned: expand the use of welded structures, increase the working shifts of metal working equipment at plants of the industry; increase the productivity of labor at enterprises; reduce the number of workers involved in manual labor on basic and auxiliary work and work with heavy and harmful working conditions, introduce systems of automatic design of technological processes, and new designs of forging-press equipment; and reduce metal losses in their manufacture.

Considerable capital investments are being allotted to solve the problems posed before the industry on increasing output, improving designs, raising the technical standards and quality, developing a procurement base, and creating a stockpile for future development of the forging-press machine building.

The construction of the following three new plants is called for:

The Ivano-Frankovskiy Heavy Press Building Plant for producing heavy and special design 10,000 to 12,000 ton-force presses with a large procurement base;

The Pinskiy Automatic Line Plant for hot volumetric stamping using hot stamping presses, mainly for industries with mass-produced goods;

The Khmelnitskiy Plant -- the first plant in our country specializing in producing manipulators.

Special attention will be given to expanding the Voronezhskiy PO TMP, the Ryazanskii PO, the Odesskiy PO, the Khmelnitskiy PO TPA [expansion unknown], the Sal'skiy KPO Plant, the Azovskiy KPO and KPA [Forging-press Automatic Machine] plants, the Barnaul'skiy Mechanical Press Plant as well as to completing the construction of the Nelidovskiy Hydraulic Press Plant.

The construction of new plants, the expansion and the modernization of existing PO will make it possible to increase considerably putting new capacities in operation, improve the structure and better meet the requirements of the national economy in forging-press equipment, increasing thereby the efficiency of machine building and metal working.

A great deal of attention was given to introducing machine tools with ChPU, automated sections of machine tools with ChPU and robots with computer control.

The introduction of machine tools with ChPU and automated sections, in which productivity is increased on the average of two to three times, while their use practically provides work for almost two full shifts, will make it possible, due to this measure alone, to free a great number of machine tool operators at plants.

At the Sal'skiy KPO Plant, three electric slag casting (EShL) installations were introduced for making eccentric shafts increasing the metal utilization coefficient from 0.35 to 0.85 and saving about 1000 tons of metal. The EShL technology will be introduced at the Orenburg, Ivano-Frankovskiy, Kuvandykskiy, Nelidovskiy and other plants.

The volume of using welded structures in KPM [Forging-press machines] must be increased considerably. To implement this task, it is planned to build shops and create new capacities for welded structures at the Dnepropetrovsk, Nelidovskiy, Ruzayevskiy, Ivano-Frankovskiy, Pinsk and other plants.

An important factor in increasing the efficiency of production, raising the quality, and reliability of KPM is also the further development of centralized production of standard units. The development of centralized production units is based on creating specialized shops at a number of plants (Ryazan', Nelidovsk, Orenburg, etc.).

The efforts of plants, PO, technological institutes in the industry, the GPTIkuzmash, the Orgkuzmash and the TsBKM [Central Planning Design Bureau of Forging-Press Machine Building] are directed toward the solution of all these problems.

The solution of industrial problems in raising technical standards, expanding the number of types and improving the design of the manufactured KOP, attests to the large volume of future scientific research and planning-design work. Taking into account the scarcity of workers, in the Eleventh Five-Year Plan period, special attention will be given to introducing systems of automated planning of new equipment designs and technological processes for their manufacture.

The technical standards and the quality of products in machine tool building depends greatly on the efforts of related industries that supply units and products for machine tools, including precise bearings, electric motors, programmed control systems and various electronic devices. Their high standard and excellent quality will make it possible to create first class KPO.

At present, raising the technical standards of KPO is slowed by low standards and a limited variety of products and materials required in building the equipment, such as electric equipment, devices, ChPU systems, hydraulic equipment and lubrication. Specific conditions for operating KPO impose special requirements on products necessary to complete the machines. Yet, the assimilation of series production of new complementing products still proceeds very slowly.

Press builders await the assimilation and series production at the following:

enterprises of the Minelektrotekhprom -- special up to 4000kv AC and DC electric motors, including high torque motors that meet the requirements of operating in KPO; complete sets of DC and AC of electric drives and low voltage compact, reliable control devices;

enterprises of the Minneftekhimprom [Ministry of Petrochemical Industry] -- packing for pressures of up to 500kg-force/cm² using polyurethane rubbers and high pressure hose with connecting fixtures;

enterprises of the Minpribor [Ministry of Instrument Building]-- ChPU systems oriented to use on KPO; programmed controllers; vibration resistant high pressure sensors, vibration resistant compact manometers, etc;

enterprises of the Minchermet -- good quality metal for cold upsetting that meets technological requirements with respect to ductility, assortment and mechanical properties. This will make it possible to improve the quality of the stamped products considerably and increase the productivity and life of the tools.

Thus, intensive reequipment of forging-press production in the machine building and metal working sectors of the industry will be based on a radical change in the structure of KPO output, primarily to be equipped with highly efficient mechanization and automation facilities, with the industrial park supplemented by highly productive types of forging-press automatic machines, special design forging-press machines, automatic complexes and lines, modern KPO with ChPU systems that provide a high degree of automation and stability of the technological processes in forging-stamping production.

Comrade L. I. Brezhnev, General Secretary of the Central Committee of the CPSU and Chairman of the Presidium of the Supreme Soviet of the USSR, in his greeting to workers, engineers, technicians and employees of the Ivanovskoye Machine Tool Building Production Association imeni 50th Anniversary of the USSR and the Voronezh Heavy Mechanical Press Production Association noted that:

"The Central Committee of the CPSU values highly the achievements in creating special design automatic machine tools and sets of forging-press equipment and the organization of their series production on tight schedules. This latest equipment makes it possible to raise to a qualitatively new level machine building technology and the automation of metal working and solves urgent problems in increasing the efficiency of production.

The newest multioperational machines with programmed control produced by the Ivanovskiye machine tool builders increase the productivity of labor by several times and make it possible to organize their operation in the automatic mode. Powerful Voronezh presses equipped with industrial robots make it possible to introduce low waste technology, obtain high precision intermediate products and save tens of thousands of tons of metal. It is important that such machine tools and presses ease the labor of workers considerably making it more life engineering work.

Experience in the accelerated creation of new equipment accumulated in close cooperation with customer...obligation to equip production facilities fully and achieve its high efficiency are a good example for all machine builders."

Collectives of enterprises and organizations of forging-press machine building together with workers of other industries will do everything possible to convert domestic machine building into a leading sector of Soviet industry and to a true vanguard of technical progress in the national economy.

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